

REMARKS

Claims 1-10 were pending in the present application. Claims 3 and 6 have been canceled and new claims 11-14 are added herein. Thus claims 1, 2, 4, 5, and 7-14 are now pending. The applicant respectfully requests reconsideration and allowance of the present application in view of the above amendments and the following remarks.

The applicant notes with appreciation the acknowledgement of the claim for priority under section 119 and the notice that all certified copies of the priority documents have been received.

The applicant acknowledges and appreciates receiving a copy of the form PTO-1449 submitted with the Information Disclosure Statement filed on March 25, 2004 on which the Examiner has initialed all listed items.

The applicant still further notes that the specification and claims have been amended herein to correct a minor grammatical error associated with the use of the phrase “signal notifying the abnormal condition...” The phrase has been corrected throughout to read, for example, “signal notifying of the abnormal condition,” e.g. of the angular velocity sensor. No new matter has been entered.

Claims 1-9 stand rejected under 35 USC §103(a) as being allegedly unpatentable over Yukawa et al., U.S. Patent No. 6,418,790 (hereinafter “Yukawa”) in view of Kubotani, JP11-064376. Claims 3 and 6 are canceled and will not be discussed. Claims 1, 2, 4, 5, 7-9 are amended herein to address the rejection.

Claims 1, 4, 8 and 9 have been amended herein to recite, *inter alia*, the feature that a specific frequency component is extracted from a predetermined signal, that the specific frequency component is determined based on at least one of a driving system resonance frequency related to a driving system of an angular velocity sensor and a sensing system

resonance frequency related to a sensing system of the angular velocity sensor, and that the angular velocity sensor is capable of producing an erroneous output when receiving the specific frequency component of the predetermined signal. Support for the amendments can be found at lines 21-27 of page 3 of the applicant's specification, lines 27-30 of page 11, lines 1-3 of page 12 and lines 16-19 of page 12.

In making the rejection the Examiner has indicated that Yukawa teaches features of the claimed invention. Yukawa, at best, describes an angular velocity sensor having a vibrator 1, a driving circuit 9, a detecting circuit 10 and a fail detector 11. The circuit 9 makes the vibrator 1 vibrate at a resonance frequency of the vibrator 1 (see, e.g. lines 53-55 of column 2). The circuit 10 issues an angular velocity signal (see, e.g. line 14 of column 3). The detector 11 issues a DIAG signal to an outside computer when the sensor is irregular (see, e.g. lines 18-20 of column 3). Drive vibration components intentionally imbalanced are generated in Coriolis detectors 4a and 4b of the vibrator 1 (see lines 34-39 of column 3). During ordinary operation, the drive vibration components are cancelled in the detecting circuit 10. Conversely, if a breakage of the Coriolis detector 4b occurs, the drive vibration components are not cancelled in the detecting circuit 10, and a full-wave rectified/smoothed signal TP5 includes the remaining amplified drive vibration component. As a result, a level of a full-wave rectified/smoothed signal TP5 exceeds a reference level for fail judgment. In this case, the detector 11 issues a fail signal (see lines 44-67 of column 3, and lines 1-2 of column 4). Accordingly, the vibration components in Yukawa are used to judge whether a breakage occurs in the vibrator 1. However, unlike the claimed invention, the vibration components in Yukawa do not cause the vibrator 1 to be put in an abnormal condition.

Applicant further notes that the Examiner admits that Yukawa fails to teach or suggest the frequency component extracting means for extracting, from a predetermined signal, a specific

frequency component determined based on at least one of a driving system resonance frequency related to a driving system of said angular velocity sensor and a sensing system resonance frequency related to a sensing system of said angular velocity sensor, said angular velocity sensor capable of producing an erroneous output when receiving said specific frequency component of the predetermined signal and Kubotani is cited in the applied art combination as accounting for the admitted deficiency in the teaching of Yukawa. Applicants respectfully disagree with this characterization.

Applicants note that Kubotani, at best, describes a sensor abnormality detector in a vehicle movement controller. When a value detected by a yaw rate sensor 8 is stabilized, abnormality of the sensor 8 is judged when values detected by a horizontal acceleration sensor 9 are changed by a value equal to or larger than a first set value (see Abstract). However, Kubotani does not teach that the sensor 8 is put in abnormality when receiving a signal detected in the sensor 9.

In contrast, the present invention teaches an abnormality detecting apparatus wherein a specific frequency component is extracted from a predetermined signal. The specific frequency component is determined based on at least one of a driving system resonance frequency and a sensing system resonance frequency and has the possibility that an angular velocity sensor may produce an erroneous output when receiving the specific frequency component. A signal notifying an abnormal condition of the angular velocity sensor is outputted based on a level of the specific frequency component. Therefore, not only the specific frequency component is used to judge whether a signal notifying an abnormal condition of the angular velocity sensor should be outputted, but also the specific frequency component itself causes the angular velocity sensor to produce an erroneous output.

Applicants submit that the applied art combination fails to teach or suggest such features.

In addition, no evidence has been provided of a suggestion or motivation sufficient to guide one of ordinary skill in the art to combine the references. For example, Kubotani, as noted above fails to teach that a frequency component in the signal causes the abnormality, but rather is only concerned with detecting an abnormality in a yaw rate sensor by evaluating the yaw rate sensor value when the vehicle is judged to be stable.

Accordingly, for at least the reasons set forth hereinabove, a *prima facie* case of obviousness has not properly been established in that the applied art combination is not properly motivated and still fails to teach or suggest all the claimed features as required. It is respectfully requested that the rejection of independent claims 1, 4, 8, and 9 be reconsidered and withdrawn.

Claims 2, 5, and 7, by virtue of depending from independent claims 1 and 4, are allowable for at least the reasons set forth hereinabove. It is respectfully requested therefore that the rejection of claims 2, 5, and 7 be reconsidered and withdrawn.

Claim 10 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Yukawa in view of Mitamura et al., U.S. Patent No. 5,908,986 (hereinafter “Mitamura”) and Ichinose et al., U.S. Patent No. 6,584,841 (hereinafter “Mitamura”). Claim 10 is amended herein to address the rejection.

Claim 10 has been amended herein to recite, *inter alia*, the feature that a specific frequency range is determined based on at least one of a predetermined resonance frequency of a vibrator element along a vibration direction and a sensing system resonance frequency of the vibrator element along a sensing direction, and the feature that the angular velocity sensor is capable of producing an erroneous output when receiving a specific frequency component of the specific frequency range.

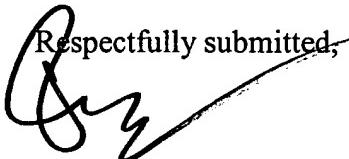
For at least the reasons set forth above, Yukawa and thus the applied art combination fails to teach or suggest features of claim 10 as amended. For example, Yukawa fails to teach or suggest aspects of the claimed first judging means, e.g. for detecting a frequency at which said vibrator element causes a displacement in said sensing direction. The first judging means checks whether or not the detected frequency is within a specific frequency range determined based on at least one of the predetermined resonance frequency of the vibrator element along said vibration direction and a sensing system resonance frequency of the vibrator element along said sensing direction. Still further the angular velocity sensor is capable of producing an erroneous output when receiving a specific frequency component of the specific frequency range. These features are clearly not taught in Yukawa. Yukawa, at best, teaches that rectified levels of a waveform are a judged by a level judging circuit 11b. However, there is no teaching in Yukawa of detecting any frequency range. Likewise there are no teachings in Mitamura or Ichinose of such judging means. Thus claim 10 as amended is clearly distinguishable from the teachings of Yukawa alone or in combination with Mitamura and Ichinose.

Accordingly, for at least the reasons set forth hereinabove, a *prima facie* case of obviousness has not properly been established in that the applied art combination fails to teach or suggest all the claimed features as required. It is respectfully requested that the rejection of independent claim 10 as amended be reconsidered and withdrawn.

New claims 11-14 are added herein. The features of new claims 11 and 13 include those defined in original claims 1 and 4, respectively and the features of new claims 12 and 14 are the same as those defined in the cancelled claims 3 and 6. Favorable consideration is respectfully requested.

In view of the foregoing, the applicants respectfully submit that the present application is in condition for allowance. A timely notice to that effect is respectfully requested. If questions relating to patentability remain, the examiner is invited to contact the undersigned by telephone.

Please charge any unforeseen fees that may be due to Deposit Account No. 50-1147.


Respectfully submitted,

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